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THE DEBT OF PHYSICS TO METAPHYSICS¹

IF I venture to address this society upon a subject where I am very liable, perhaps even likely, to be misunderstood, please bear in mind that I do so only in the belief that it is a matter of no small importance for workers in any one science to realize fully the limitations as well as the powers of their own science. It is hardly necessary to add, that while I shall consider a phase of physics which has little to do with experiment, I am not for an instant unmindful of the fact that ours is an experimental science, and that all the really great achievements in physics have been wrought through, or have led up to, or have been completed by, experiment and observation. This remark is doubtless true even of the supreme work of Newton, Fresnel and Maxwell. Nor am I forgetful that in days gone by the normal development of sound physics has been much retarded by metaphysics.

Second to none in my admiration of the man who has contributed even a single experimental fact to either the foundation or superstructure of the edifice which we call modern physics, I invite your attention for a few moments to the debit side of the account as it stands between the physicist and metaphysician. This I do with no little trepidation, remembering how easily one may, even with the utmost good will, go astray in a strange field of thought. Metaphysics is a term employed with such a variety of meanings that I must, at the very outset, explain the one sense in which

¹Presidential address before the American Physical Society in New York, March 5, 1910.